**Partula on Moorea**

The rate of speciation in snails can be dated using molecular evidence and information from geologists on the age of islands. They provide evidence about possible modes of selection for reproductive isolation.  
**When did Crampton make his observations?**

* Tahiti- 1916
* Moorea- 1932

**What does Prof Bryan Clarke wear on collecting trips?**

He wore pyjama top because of the hot conditions. The pyjama top also has a pocket, this allows him to put snails in it.

P. suturalis (right and left coiling)  
P. taeniata  
P. mirabalis  
P. tohiveana  
  
The allozyme information can be used to reconstruct evolutionary history by within and between species comparisons.  
The whole anatomy including the position of the genital aperture is affected by right and left coiling. Within species, right and left coiled morphs have reduced success in mating.  
  
  
**Why should there be such a pattern?**

Different patterns have arisen by a mutation and then became fixed because of the speparation caused by the physiclal differences in gential structures.

The LH ones were found in the north of the island. The right hand was found in the south.

* If they interbred, the offspring would be less fit and or infertile.
* Polypolody is a mechanical barrier to inappropriate mating.
* A mutation occured from the left mother and she had a right offspring- selection on the right hand one, then lead to freq dependant selection which is selection against the minotrity, the selection is against the mutation which causes a switch in terms of the right and the left. This is an advantage since they do not waste their gametes.
* If there are rare alleles, freq dependant selection occurs in the minority and mating efficiency is reduced.  
   **How do Crampton's observations corroborate this story?**
* Crampton went to Moorea and Tahiti. He studied the different species on the two islands. Sp. Partula. In terms of phenotypes and locations on the island in comparisson to different landscapes.
* He classified the snails according to shell coiling, RH coloing was dextral, the left hand coliling- sinistral.
* Brian wanted to find out the molecular compotisition.
* He found that the family of genes responsible for the allozyme composition between snails on different islands were from the same family of genes; however they were significantly different to each other.
* These two observations are linked as the species show they have a common ancestor which accounts for the similiarities in their genome, yet they have different phenotypes due to adapatations to differnt environments.  
    
  **How does the molecular evidence show that speciation occurred in situ on the islands.**
* Similar allozyme composition from snails on differnt islands. Variation in the DNA is correlated to the relation between the species.
* use data in Hb to see if genes were fixed in the whole genome  
  rate of substitution – mutation rates occured at different times- leading to speciation as it is faster on newer islands and less vigrous on the older islands.
* Species on different islands show they have the same family of enzymes, they were however distinct from each other on each island.  
    
    
  **What are the ages of Tahiti and Moorea. Tahiti:**
* To work out the ages, they looked at the rocks whcih are used as molecular clocks that suggest Tahiti- 1mya and Moorea- 1.5 mya.  
    
  **What are the relative rates of evolution on these islands and the Society islands?**
* Snails on New islands evolve faster because new islands require new adaptations
* Founder effect leads to genetic drfit that leads to fixation of mildly deleteriuos alleles
* As new virgin Islands are developing or changing, the snails require new adaptations to keep up with the new environment, the changes occur more readily in smaller populations leading to a higher rate of genetic drift. However, in the older islands , the environment is more stable, therefore the snails do not need to adapt- slower rate of change.  
    
    
  **Why is it difficult to explain these rates of evolution if selection is responsible for substitutions?**
* It can be hard to explain rates of evolution by selection because if a certain allele was selected for, it would mean that the other alleles were less advantageous therefore over time would get selected against and the whole population would not have a high frequency of different alleles.
* This is not true when observing the phenotypes since the islands consist of a large number of different phenotypes in terms of colour, shell banding and coiling.